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Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of	)	
	)	
Amendment of Parts 73 and 74	)	MM Docket No. 96-58
of the Commission's Rules To	)	
Permit Certain Minor Changes in Broadcast	)	
Facilities Without a Construction Permit	)	

REPLY COMMENTS OF SHIVELY LABS

INTRODUCTION

Shively Labs, a division of Howell Laboratories, Inc., is a designer and manufacturer of passive broadcast transmission products including FM antennas. Shively has over 30 years of experience and has delivered thousands of antennas worldwide. Shively believes it has supplied a large proportion of the licensed directional antennas in the United States.

Shively Labs supports the Commission's endeavors to codify its policies. However, with respect to directional antennas, the Commission has chosen to look at only small parts of a very complex issue. Shively believes that the Commission should look at all aspects of the FM directional antenna rules and policies, in order that the Commission staff, broadcasters, consultants and manufacturers will know precisely what the Commission requires with respect to FM directional antenna systems and to avoid unnecessary complexity.

Applicants are required to supply a proof of performance report for final licensing of a directional antenna system. As far as Shively knows, there is no standard format for a proof of performance report. Standardization of a format would insure that all directional antenna systems are licensed to the same standard. Actually the rule, §73.316(c)(8), requires only a "statement...that the antenna has been installed pursuant to the

manufacturer's instructions" which is something less than an engineer's certification of actual performance. However, the usual construction permit for a directional antenna sets out technical requirements for a "proof of performance report" that seem to imply measurements by the manufacturer.

Shively provides its customer applicants with a proof of performance report based on its measured pattern range results. Some other manufacturers have the station engineer sign a report. It is unclear who is right; but it is clear that Shively's method is better. It is even clearer that clarification is needed.

Established FM antenna manufacturers have invested many thousands of dollars to operate and maintain their antenna pattern ranges so that reliable and repeatable directional antenna patterns can be measured. On the other hand, start up or foreign manufacturers can offer FM directional antenna systems at reduced prices, with no regard to substance to their installation instructions or their basis of actual, because there is no standard for these manufacturers to meet.

Reply comments on Program Test Operation for FM Stations with Directional Antennas.

Shively Labs agrees with those comments to the Commission which take the position that a two-step process for FM stations employing a directional antenna is burdensome and unnecessary. Having a standardized format for the proof of performance report along with the surveyor's and supervising engineer's certifications, the Commission's staff will know that a directional antenna system meets the requirements at time of installation.

Reply comments on Requirement that FM Measured Directional Composite Pattern Fill 85% or More of FM Directional Composite Pattern.

Since Dennis Williams described the 85% RMS policy to a luncheon meeting of the AFCCE in the Mid 80's, the Commission staff, in general, has been applying this policy as described in most of the comments filed during the comment stage of this docket. That is, the RMS of the measured composite relative field pattern must not be less than 85% of the RMS of the authorized composite relative field pattern.

Shively Labs manufactures FM directional antenna systems that comply with the policy as described above. If the Commission decides to change the policy to reflect 85% of the area. Shively will continue to manufacture FM directional antenna systems that comply to the tougher policy. It just seems that arbitrarily changing a policy that has been in effect for several years is inconsistent with good engineering practices.

Most comments filed under this docket do a fine job of explaining why the policy should remain as most of us remember it. The comments filed by the firm of du Treil, Lundin & Rackley make a good case for eliminating the 85% policy altogether.

Shively Labs believes that the parts of this docket MM No. 96-58 pertaining to FM directional antenna systems should be removed from this docket and that a new docket be opened so that all the rules and policies concerning FM directional antenna system can be reviewed as a single comprehensive issue. The review should look at the whole process starting with the rules and policies that have to be followed when the FCC form 301 is being filed out.

Under the present system, information about a directional antenna may or may not reflect the final directional antenna configuration. In most cases the person filling out the Form 301 does not need to know the final antenna configuration. A theoretical composite relative field pattern is shown. As noted is some of the comments, this theoretical pattern is usually based on calculations not on an actual antenna system. Having a manufacturer supply a measured pattern is expensive and time consuming for the broadcaster. Especially when the Commission may deny the application.

So we are back to this theoretical composite pattern. During the days of Docket 80-90 a large number of composite patterns may have been calculated but the calculations were based on measured data. That is to say that a manufacturer was contacted and information was supplied by the manufacturer so that when and if a construction permit was issued, almost any manufacturer could design and build a directional antenna system that met all the rule and policies. Another point to make is that in many cases a broadcaster could easily find a tower or he could build his own tower. This control of the tower allowed a great deal of flexibility when it came time to design a directional antenna.

More recently the demand for existing tower space is at a premium. Broadcasters are forced to find space on larger and larger towers. So this tower flexibility is no longer available to the designer. The problem is, that the larger the tower, the more difficult it is to manufacture a directional antenna regardless of what the composite pattern looks like.

It also seems that the theoretical composites are no longer based on calculated antenna data. The trend has been that the theoretical composite patterns have gone from calculated patterns based on measured data to purely theoretical composite patterns with no regard to the reality of tower effects and the like.

In discussing directional antenna systems Shively finds that most broadcasters think that if their protection requirement is only 1 or 2 dB then the design of the directional antenna is very easy, but if their protection requirement is 10 dB, then the directional antenna design is more difficult. This is not the case, especially with any 85% policy. For example in Exhibit 1 where the protection requirement is 10 dB, the measured directional pattern almost fills the composite pattern and any 85% policy is easily met. If a theoretical composite pattern has only a one 1 dB protection requirement as in Exhibit 2 (shaded area), then the area of the theoretical composite pattern is almost 100% relative field or almost the same as a virtually perfect omni-directional pattern. **Exhibit 2** shows the relationship between a 1 dB protective requirement composite pattern and an actual measured omni-directional panel antenna pattern. Together they show that contrary to superficial common sense the present 85% requirement makes it easier to meet large protects and difficult to meet small protects. Under the proposed 85% of area rule meeting the small protect would be impossible.

Manufacturing a directional antenna system on a large tower that has to meet a RMS value between 80% to 85% is more difficult than manufacturing a directional antenna on a small tower with a RMS value of 70%. In other words, as the rules and policies stand today, the measured pattern shown in Exhibit 1 could not comply with the composite shown in Exhibit 2.

CONCLUSION

The foregoing discussion of the variances between theoretical calculations, broadcasters' understandings and real world results and the divergence of licensing practice from the language of the rules point up the desirability of a more thorough review of both the technical and policy considerations relating to directional FM antennas.

Respectfully Submitted,

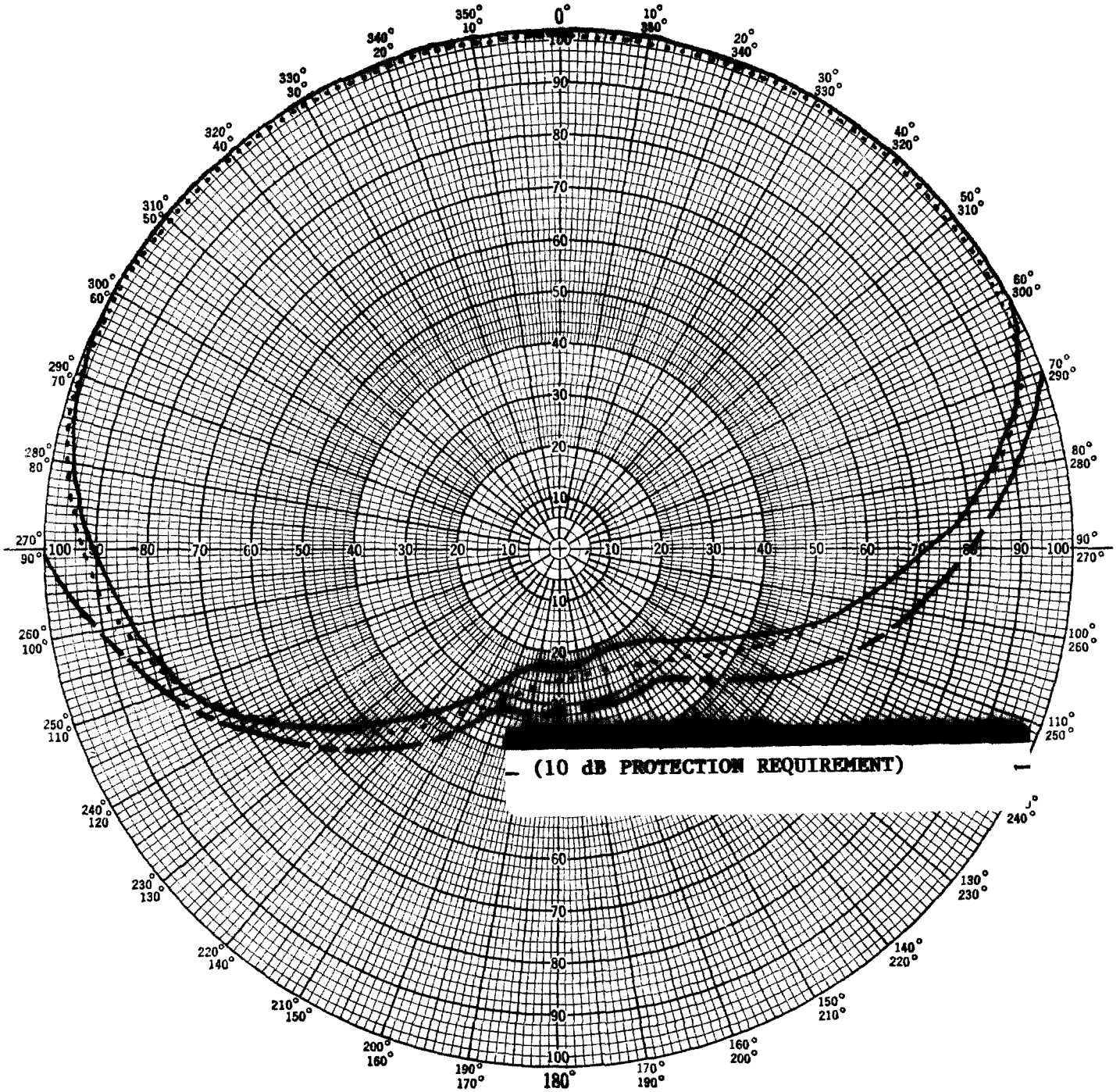
Shively Labs

June 14, 1996

By: 

Robert A. Surette
RF Engineering Manager

EXHIBIT 1



COMPOSITE PATTERN ——— — ———

HORIZ. COMPONENT ———————

VERT. COMPONENT - - - - - - - - - -

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PROJECT NAME _____

PROJECT NUMBER _____ DATE _____

MODEL ( ) FULL SCALE ( ) FREQUENCY _____

POLARIZATION _____

CURVE PLOTTED IN: VOLTAGE ( ) POWER( ) DB( )

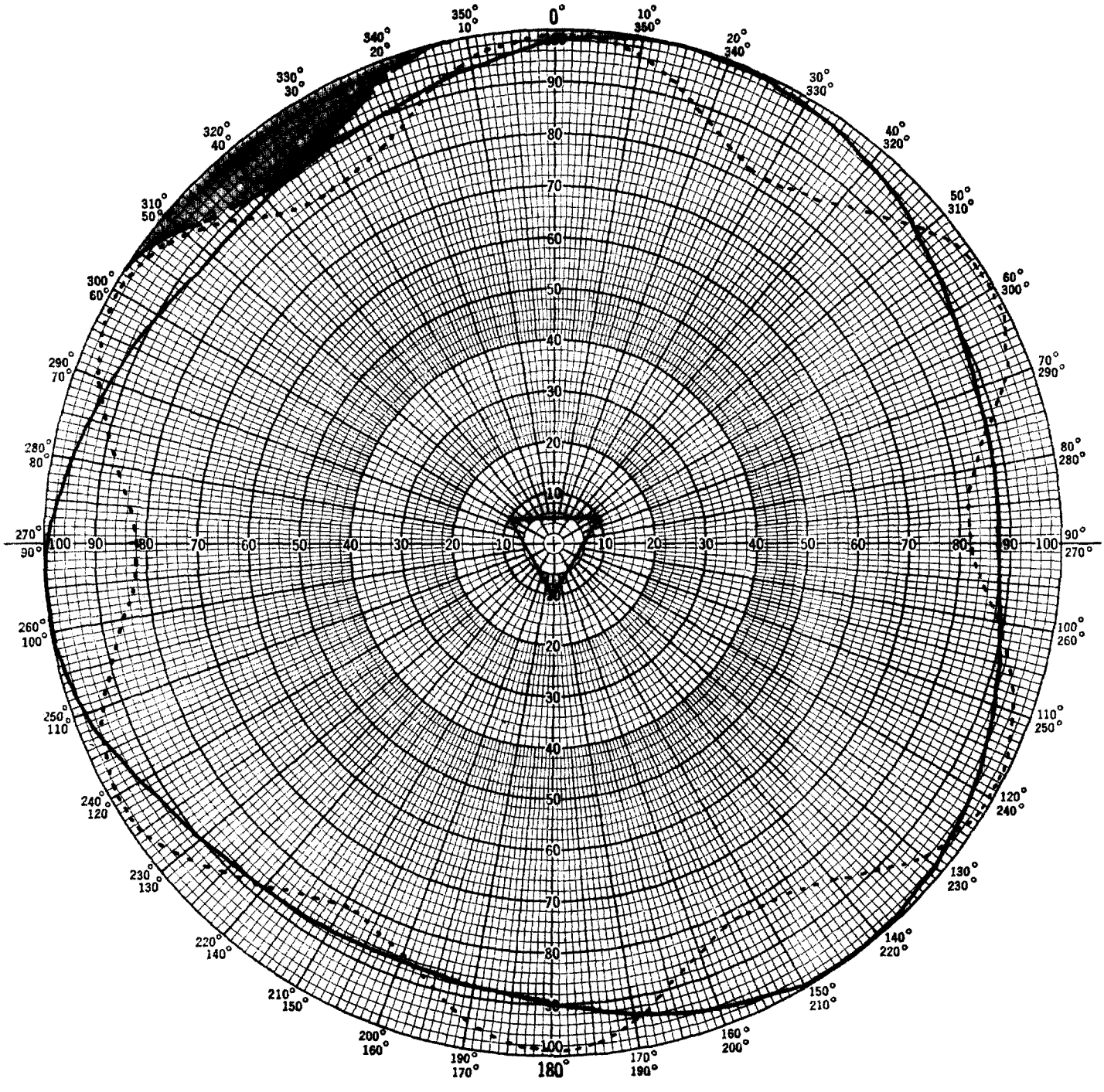
OBSERVER _____

ANTENNA TYPE _____

PATTERN TYPE _____

REMARKS: _____

EXHIBIT 2



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REMARKS: _____